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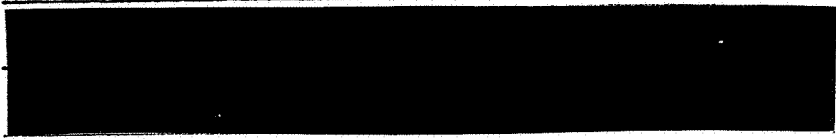
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SEE INDEX REVIEW

DATE: IN 2/24/78 OUT 8/31/78 IN _____ OUT _____
FISH & WILDLIFE ENVIRONMENTAL AGENCY EFFICACY

FILE OR REG. NO. 270-REO
PETITION OR EXP. PERMIT NO. ---
DATE DIV. RECEIVED _____
DATE OF SUBMISSION _____
DATE SUBMISSION ACCEPTED _____
TYPE PRODUCTS(S): I, D, H, F, N, R, S Insecticide-Additive
DATA ACCESSION NO(S). _____
PRODUCT MGR. NO. '(13) Jim Red
PRODUCT NAME(S) LURE'EM II
COMPANY NAME Farnam Companies, Inc.
SUBMISSION PURPOSE Registration

CHEMICAL & FORMULATION Muscalure (ai).....0.05%



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INERT INGREDIENT INFORMATION IS NOT INCLUDED

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100.0 Pesticidal Use

For use as a fly (muscidae) attractant in conjunction with a fly bait in and around livestock feeding yards, pig parlors, stables, broiler houses, caged poultry and turkey, dog kennels, food, poultry and meat processing plants.

100.1 Application Methods/Directions/Rates (As Proposed)

Directions for Use: Scatter Lure'em II ~~over~~ in equal volume to an approved fly bait to attract flies and encourage feeding. Use Lure'em in and around loafing sheds, livestock pens, pig parlors, stables, broiler houses, dog kennels, and fur-bearing animal units. Also use in inedible areas of food, poultry, and meat processing plants. (See Conclusions for recommended labeling.)

100.2 Precautionary Labeling

Do not contaminate water by cleaning of equipment or disposal of wastes. Do not reuse empty container. Destroy it by crushing. Discard in safe place away from water supplies.

101.0 Chemical and Physical Properties

101.1 Chemical Name

Cis-9-Tricosene

101.2 Common Name

Muscalure, Muscamone, Z-9-Tricosene

102.0 Behavior in the Environment

A complete review by the Environmental Chemistry section is not available. See reviews by T.F. O'brien (11/1/77) and F.S. Betz (11/9/77).

103.0 Toxicological Properties

103.1 Acute Toxicity--Mammal (See chart, Page 2)

103.1.2 Summary of Basic Fish and Wildlife Data (See chart, Page 3)

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103.1 Acute Toxicity--Mammal

Summary of Data reviewed by Toxicology Branch:

<u>Organism</u>	<u>Test</u>	<u>Result</u>	<u>Acceptability</u>
Albino Rat	Acute Aerosol Inhalation	LC ₅₀ > 26.2 mg/L	Core-Minimum
Albino Rat	Acute Oral	LD ₅₀ > 23.07 g/kg	Core Minimum
Rabbit	Acute Dermal	LD ₅₀ > 2025 mg/kg	Core-Minimum
Albino Rabbit	Eye Irritation	No irritation at 7 days	Core-Minimum
Rabbit	Skin Irritation	Mild Irritation	Core- Minimum

103.1.1.2 Summary of Basic Fish and Wildlife Data

<u>Organism</u>	<u>Test</u>	<u>Result</u>	<u>Acceptability</u>
Mallard	Acute Oral LD ₅₀	LD ₅₀ > 4640 mg/kg	Core
Mallard	Subacute LC ₅₀	LC ₅₀ > 10,000 ppm	Core
Bobwhite Quail	Subacute LC ₅₀	LC ₅₀ > 10,000 ppm	Core
Rainbow Trout	96 hour Acute LC ₅₀	LC ₅₀ > 1000 ppm	Core
Bluegill Sunfish	96 hour Acute LC ₅₀	LC ₅₀ > 1000 ppm	Core
<u>Daphnia</u>	48 hour Acute LC ₅₀	LC ₅₀ = 1.08(0.83- 1.40) ppm	Core

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104.0 Hazard Assessment

104.1 Discussion

Lure'em II is to be applied in an equal volume to an approved fly bait containing a toxicant such as DDVP or methomyl. Use rates for these baits are typically $\frac{1}{4}$ pound per 500-1000 square feet, although use for direct application to poultry manure calls for a rate of $\frac{1}{4}$ pound per 100 square feet.

For the purpose of calculating expected residue levels, a maximum rate of $\frac{1}{4}$ pound per 500 square feet will be assumed. Lure'em II is about .05% ai., therefore the maximum application rate would result in .01 pounds ai/acre which would result in residues of .22 ppm ai in the top 0.1" soil surface or 0.104 mg ai/square foot.

104.1.1 Likelihood of Exposure

Exposure of non-target organisms and potential hazards associated with Z-9-Tricosene have been discussed in two previous reviews (F. Betz, 11/9/77 and T. O'brien, 11/1/77). In summary, acute hazards are not expected based on the high LD₅₀ and LC₅₀ values for avian and fish species and the relatively limited use pattern. Chronic hazards to avian species are a more real possibility based upon the low effect levels (2-20 ppm) observed in Mallard reproduction studies. The remainder of this review deals with an assessment of this potential hazard.

Three separate avian reproduction studies have been conducted on Mallards and two studies on Bobwhite Quail (one study abstracted in this review, other studies were submitted previously and abstracted in review by O'brien 11/1/77) Bobwhite Quail treated at 2 and 20 ppm showed no adverse effects. Data reviewed with this submission reported Mallard reproduction impairment at 20 ppm, while a previously submitted report showed impairment at 2 ppm. The third study (previously submitted) showed no impairment at 0.1 ppm. Results are presented on the following page.

COMPARISON OF MALLARD REPRODUCTION STUDIES

Parameter	0.1 ppm (Fink 1975a)	2 ppm (1974)	2 ppm (Fink 1975b)	20 ppm (Fink 1974)	20 ppm (Fink 1975b)
Viable Embryos	NE	NE	NE	SD (P 0.1)	NE
Live 3 week embryos	NE	NE	NE	SD (P 0.1)	NE
Normal Hatchlings	NE	SD (P 0.1)	NE	SD (P 0.1)	NE
14 day old Survivors	NE	SD (P 0.05)	NE	SD(P 0.05)	NE
Viable embryos of eggs set	NE	NE	NE	SD (P 0.01)	NE
Normal Hatchlings of live 3 week embryos (%)	NE	SD (P 0.05)	NE	SD (P 0.05)	SD (P 0.05)
14 day Survivors of normal hatchlings (%)	NE	SD (P 0.01)	NE	SD (P 0.01)	NE
14 day Survivors per hen	NE	SD (P 0.05)	NE	SD (P 0.05)	SD (P 0.05)

Chart Notes: See Page 6.

- Chart Notes:
1. NE = no statistically significant difference between control and treatment group.
 2. SD = statistically significant difference between control and treatment group.
 3. Fink 1974 = study conducted for Zoecon Corporation at 2 and 20 ppm.
Fink 1975a = study conducted for Zoecon Corporation at 0.1 ppm.
Fink 1975b = study conducted for Farnam Incorporated at 2 and 20 ppm.
 4. None of the studies showed adverse effects as judged by the following parameters: eggs laid, eggs cracked, eggs laid/hen in 8 weeks, eggs cracked of eggs laid (%), live three week embryos of viable eggs (%).

Unfortunately, results of the Mallard reproduction studies at 2 and 20 ppm are not consistent. One study showed impairment at 2 ppm while the other did not. The reason for this difference is unknown, but for the purpose of hazard assessment it will be assumed that reproductive impairment begins somewhere between 0.1 and 2.0 ppm and that 0.1 ppm is a no observed effect level.

As stated previously, the application rate of 0.01 pounds Z-9-Tricosene (a.i.) per acre results in 0.1 mg ai/square foot. Using adult Mallards as an example, all the bait in 1-20 square foot area would have to be consumed in order to reach a level between 0.1 and 2 ppm Z-9-Tricosene in the diet. In terms of weight, this amounts to only .1 to 2 mg out of a daily diet of 100 grams. (Calculations based on adult Mallard body weight of 1000 grams and daily food consumption of 100 grams.)

The effect level of Z-9-Tricosene for reproductive impairment is quite low (0.1 2.0 ppm) and based upon the above calculations, the likelihood of exposure appears high. However, a careful examination of the use pattern and the species at risk indicates that exposure, and thus risk, should be low.

Based on the assumption that reproductive impairment caused by Z-9-Tricosene is limited to waterfowl species, the likelihood of exposure is significantly reduced since waterfowl would not readily use the sites of application for feeding. Furthermore, only limited areas at application sites need to be treated since the material is an attractant. For example, Zoecon, Inc. estimates that in a cattle feedlot containing 50,000 head of cattle, total treatment area would be just over two acres comprised of narrow strips of land. The basis for limiting the expected hazard to waterfowl is twofold. First, reproduction studies on Bobwhite Quail showed no adverse effects at levels up to 20 ppm. Second, Z-9-Tricosene is a naturally occurring pheromone in houseflies (Muscidae) with each female containing about 0.01 mg muscalure (Voaden et al., cited in review by O'brien). Thus, it seems logical that omnivorous and insectivorous birds (upland gamebirds and songbirds) are not susceptible to adverse effects from Z-9-Tricosene because Muscidae may be a part of their natural diet.

Z-9-Tricosene is formulated [REDACTED]
This type of formulation reduces the likelihood of waterfowl exposure since it is not a preferred food item. Therefore, even if waterfowl did feed extensively in the application sites, the type and size of the bait would not be highly attractive to waterfowl.

Finally, due to the small granule size of the bait and the extremely small amount of active ingredient contained in each granule (about 0.35 ug ai), it is unlikely that waterfowl would be able to forage enough granules to obtain a hazardous quantity of Z-9-Tricosene, particularly on a daily basis. It is estimated that at an application rate of $\frac{1}{4}$ pound per 500 ft², each square foot would contain about 286 [REDACTED] granules (20 ft² contains 5720 granules.) (Calculations based upon information from Borthwick, 1973). As stated previously, an effect level could be reached if a bird foraged all the bait in 1-20 square feet. Although 1-20 square feet could be foraged, it is unlikely that 286-5720 individual [REDACTED] granules would be foraged.

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Therefore, on the basis of the factors discussed above, it is concluded that Z-9-Tricosene, when used as proposed, will not pose an unacceptable risk in terms of avian reproductive impairment.

Note: Any proposal for the use of Z-9-Tricosene that would involve a change in formulation, use rate or site of application will warrant further close examination to assess the likelihood of avian reproductive impairment because the adverse effect level of this material is so low.

104.1.2 Endangered Species Considerations

Based upon the low acute toxicity of Z-9-Tricosene, and the low use rate, acute hazards to endangered species are not anticipated. Chronic hazards (i.e. avian reproductive impairment) is not anticipated due to the low probability that any endangered avian species will feed to a significant extent in the treated areas.

104.1.3 Adequacy of Toxicity Data

The six basic fish and wildlife studies have been submitted and are acceptable. An avian reproduction study was submitted and is acceptable.

104.1.4 Additional Data Required

No additional data are required for this registration.

105.0 Classification

This product is classified for general use. Calculations to support this classification are presented in the chart on Page 9.

This product is a granular bait [REDACTED] containing 0.048% Z-9-Tricosene which is equivalent to 480 ppm Z-9-Tricosene. Based upon the rat, mallard and Bobwhite Quail studies, avian and mammalian species could feed solely on the pesticide product and still be exposed to four times less than 1/5 their LC₅₀. Thus, the product clearly falls into the general use classification.

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CLASSIFICATION

<u>Parameters</u>	<u>Organism</u>	<u>General</u>	<u>Restricted</u>	<u>Rebuttable Presumption</u>
A	<u>Mammal</u>	<u>1/5 LD₅₀</u>	<u>1/5 LD₅₀ to LD₅₀</u>	<u>LD₅₀</u>
	Rat:	1/5 (23,070 mg/kg or 46,140 ppm) = 9,228 ppm	NA	NA
	<u>Avian</u>	<u>1/5 LC₅₀</u>	<u>1/5 LC₅₀ to LC₅₀</u>	<u>LC₅₀</u>
B	Bobwhite:	1/5 (10,000 ppm) = 2,000 ppm	NA	NA
	Mallard:	1/5 (10,000 ppm) = 2,000 ppm		
	<u>Aquatic</u>	<u>1/10 LC₅₀</u>	<u>1/10 LC₅₀ to .1/2 LC₅₀</u>	<u>1/2 LC₅₀</u>
C		NA	NA	NA

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106.0 RPAR Criteria

No RPAR criteria are triggered by this use.

107.0 Conclusions

107.1 Environmental Fate and Toxicology Acknowledgement

Pertinent data from these disciplines were recently reviewed by T. O'brien (11/1/77) and F. Betz (11/9/77).

107.2 Classification

This product is classified GENERAL USE.

107.3 Labeling

"Directions for Use" should be modified to read as follows:

"Not for use in conjunction with fly bait products containing Z-9-Tricosene. For products not containing Z-9-Tricosene, scatter Lure'em II over treated area in a volume equal to the fly bait in use, but not in excess of ¼ pound per 500 square feet. Use Lure'em II in and around loafing sheds, livestock pens, pig parlors, stables, broiler houses, dog kennels and fur-bearing animal units. Also use in inedible areas of food, poultry, and meat processing plants."

107.4 Data Adequacy

Adequate data have been submitted to support the registration of this product.

107.5 Recommendations/Conclusions

1. The Environmental Effects Branch has no objection to the registration of this product provided that use directions are modified as suggested.

2. Any proposal for the use of Z-9-Tricosene that would involve a change in formulation, use rate or site of application will warrant further close examination to assess the likelihood of avian reproductive impairment. The need for this is based upon the low adverse effect level

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of this material in wild waterfowl.

Fred Betz, Aquatic Biologist

Fred Betz

EEB, MED

September 1, 1978

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